

CLAIMS

1. A wet dust removal apparatus including in combination  
5 a housing having an inlet and an outlet, the housing adapted to contain  
powered air induction means adapted to induce air contaminated with particulate  
matter into the inlet,  
water spraying means adapted to spray a mist of water into the induced air stream  
to capture the particulate matter,  
10 water removal means downstream of said water spraying means adapted to  
remove water droplets containing the particulate matter prior to the air exiting the  
housing via the outlet,  
the water removal means positioned in the housing parallel to the direction of the air  
flow, wherein  
15 the parallel position, by presenting a minimal drag profile in the air flow reduces the  
air pressure and velocity required to remove dust for a given volume of air, and  
wherein in use, the energy consumption of the air induction means is thereby also  
reduced.
2. A wet and dry dust removal apparatus for drilling applications including in  
20 combination  
a housing having an inlet and an outlet, the housing adapted to contain  
powered air induction means adapted to induce air contaminated with large and  
small drilling particulate material from the vicinity of a drilling operation into the inlet  
via a suction passage connected to the inlet,  
25 cyclonic vacuum means adapted to remove by vacuum, the large and small  
particulate material,

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water spraying means adapted to spray a mist of water into air exiting from the vacuum means to capture any fine dust particles escaping the vacuum means, water removal means downstream of said water spraying means adapted to remove water droplets containing the dust prior to the cleaned air exiting the housing via the outlet,

the removal means positioned in the housing parallel to the direction of air flow wherein the parallel position, by presenting a minimal drag profile in the air flow reduces the air pressure and velocity required to remove dust for a given volume of air and, wherein in use, the energy consumption of the cyclonic vacuum means is thereby also reduced.

3. A wet dust removal apparatus as claimed in claim 1 or claim 2 wherein, the housing comprises a rectangular or cylindrical vessel having the inlet and outlet at either end.
4. A wet dust removal apparatus as claimed in claim 1 or claim 2 wherein, the vessel is fabricated from sheet steel which is welded or is of fiberglass or aluminum construction.
5. A wet dust removal apparatus as claimed in claim 1 or claim 2 wherein there are directional vane members for directing the air flowing out through the outlet in a preferred direction.
6. A wet dust removal apparatus as claimed in claim 1 or claim 2 wherein the powered air induction means comprises an electric or hydraulic drive mechanism powering a fan,
7. A wet dust removal apparatus as claimed in claim 6 wherein, the fan is a multi-bladed fan.

8. A wet dust removal apparatus as claimed in claim 1 or claim 2 wherein the water spraying means comprises a plurality of water spray nozzles adapted to spray water droplets in the order of 100 microns in size.
- 5 9. A wet dust removal apparatus as claimed in claim 8 wherein the nozzles are connected to a manifold into which water is injected under pressure.
10. A wet dust removal apparatus as claimed in claim 1 or claim 2 wherein the water removal means comprises a mist eliminator fabricated from stainless steel or plastic filaments of various diameters and compositions.
- 10 11. A wet dust removal apparatus as claimed in claim 10 wherein the individual filaments are between 0.05 mm to 2.5 mm in diameter.
12. A wet dust removal apparatus as claimed in claim 10 wherein the filaments are between 0.25mm and 0.50mm in diameter.
13. A wet and dry dust removal apparatus as claimed in claim 2 wherein the cyclonic vacuum means comprises a cyclone type vessel which removes particles larger  
15 than 1.00 mm in size by centrifugal action and wherein smaller particles which do not conform to the physical forces are captured by the water spraying means.
14. A wet and dry dust removal apparatus as claimed in claim 2 wherein the suction passage comprises a shroud surrounding the drill adapted to contain solid particles  
20 and dust, the shroud connected by a flexible corrugated hose to the inlet.
15. A wet and dry dust removal apparatus as claimed in claim 2 wherein the cyclonic vacuum means is electrically driven or is driven by an internal combustion engine, typically a small diesel engine.
16. A wet dust removal apparatus as herein described with reference to Figures 1a, 1b,  
25 and 1d.
17. A wet and dry dust removal apparatus as herein described with reference to Figure 3.